

FAWN LAKE



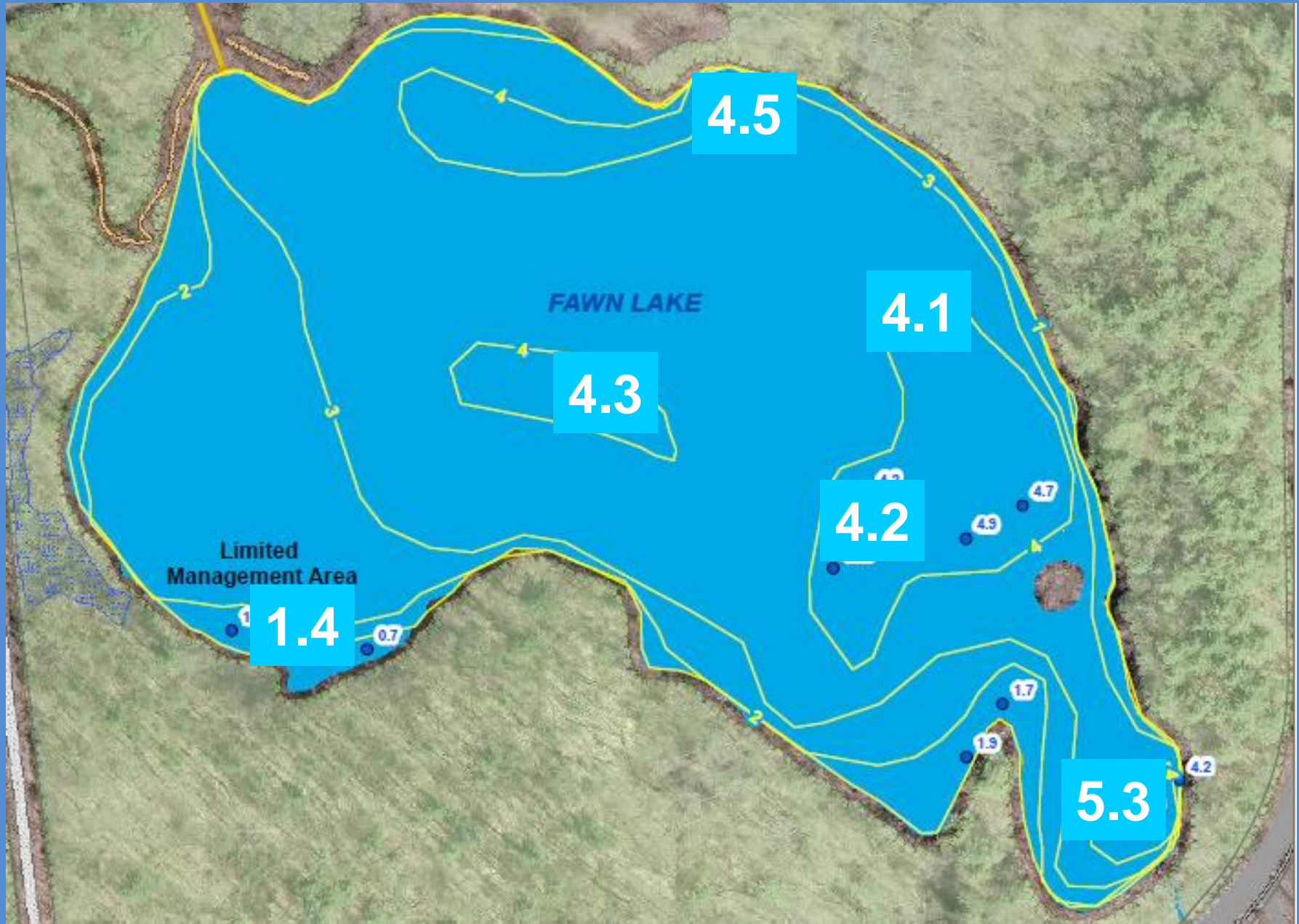
WHAT ARE THE ISSUES?

- *FLOATING & SUBMERGED VEGETATION*
- *FISH KILLS*
- *CANOE & KAYAK ACCESS*
- *INVASIVE SPECIES*
- *REDUCED LAKE DEPTH*
- *SOFT SEDIMENT ACCUMULATION*
- *LAKE CONVERTING TO SWAMP*

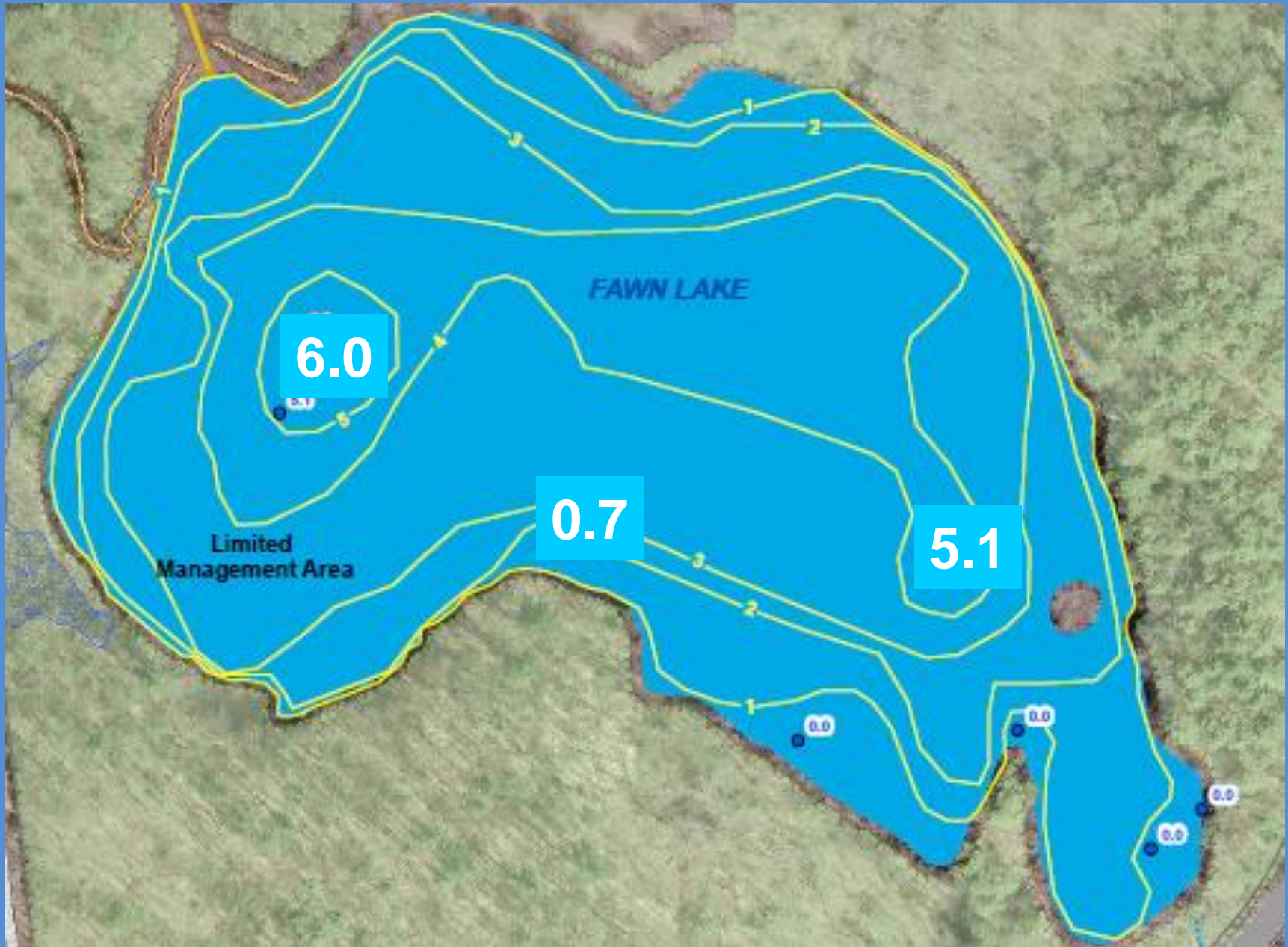
EXISTING CONDITIONS - SUMMER



BATHYMETRY (depth, ft.)



SOFT SEDIMENT DEPTH (ft.)



AD HOC COMMITTEE

- ❖ **SPRING 2015 – AD HOC FAWN LAKE COMMITTEE FORMED TO DISCUSS FUTURE OF THE LAKE AND EVALUATE OPTIONS TO RESTORE FAWN LAKE**
- ❖ **COMMITTEE MEETINGS INCLUDED PEOPLE FROM:**
 - ❖ **CONSERVATION COMMISSION**
 - ❖ **PUBLIC WORKS**
 - ❖ **SELECTMEN**
 - ❖ **HISTORIC PRESERVATION**
 - ❖ **ENVIRONMENTAL CONSULTANTS**
 - ❖ **BEDFORD RESIDENTS**
- ❖ **COMMITTEE IDENTIFIED THE FOLLOWING VALUES/BENEFITS OF FAWN LAKE**

FAWN LAKE VALUES

- *CONSERVATION / OPEN SPACE*
- *RECREATION*
- *ENVIRONMENTAL DIVERSITY*
- *EDUCATION*
- *HISTORICAL AUTHENTICITY*

CONSERVATION



RECREATION



ANIMAL DIVERSITY



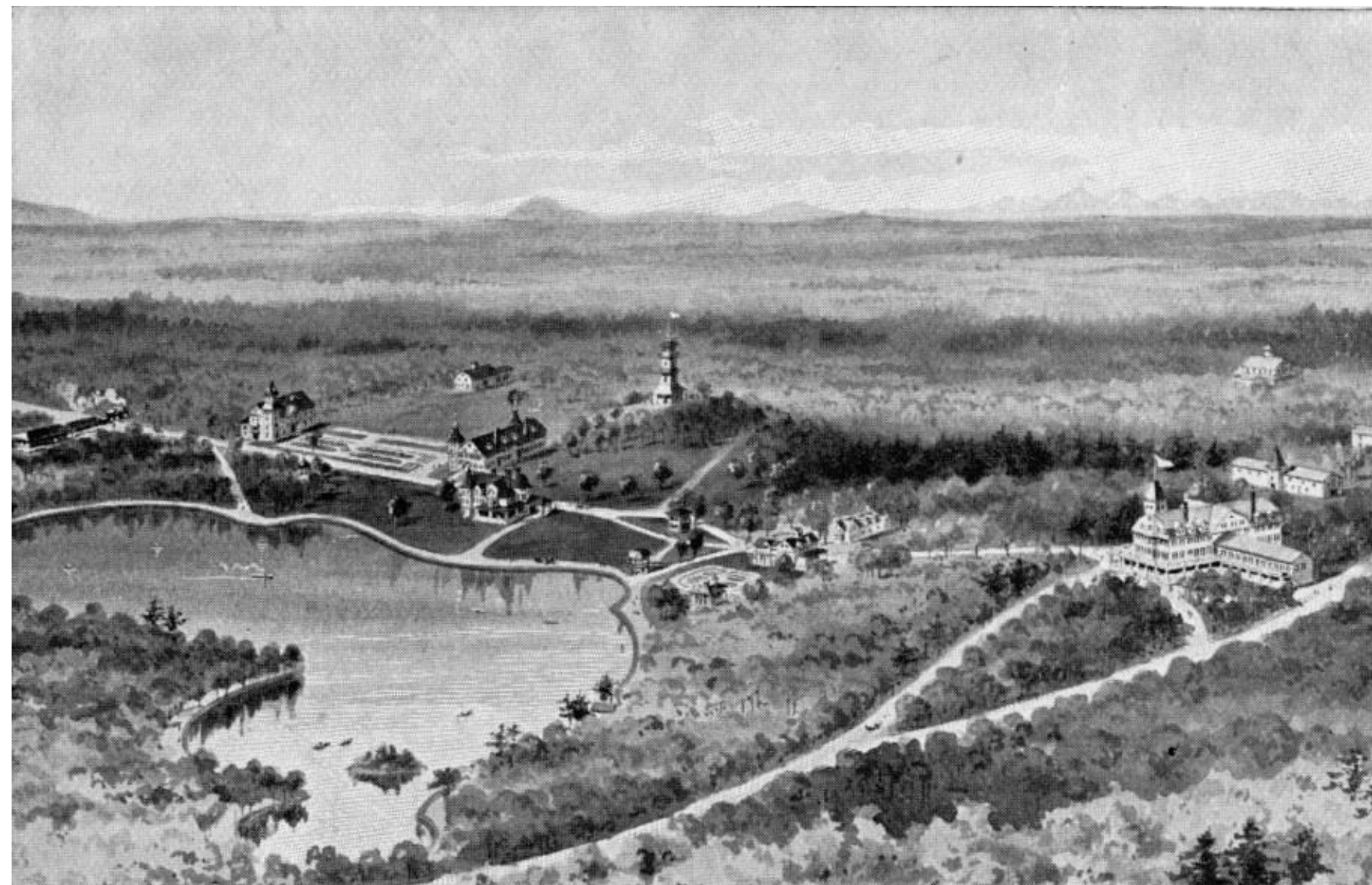
PLANT DIVERSITY



EDUCATION

- *PROMOTE ENVIRONMENTAL STEWARDSHIP*
- *ENCOURAGE RECREATION*
- *LANE SCHOOL WALKING TRIPS*

HISTORY



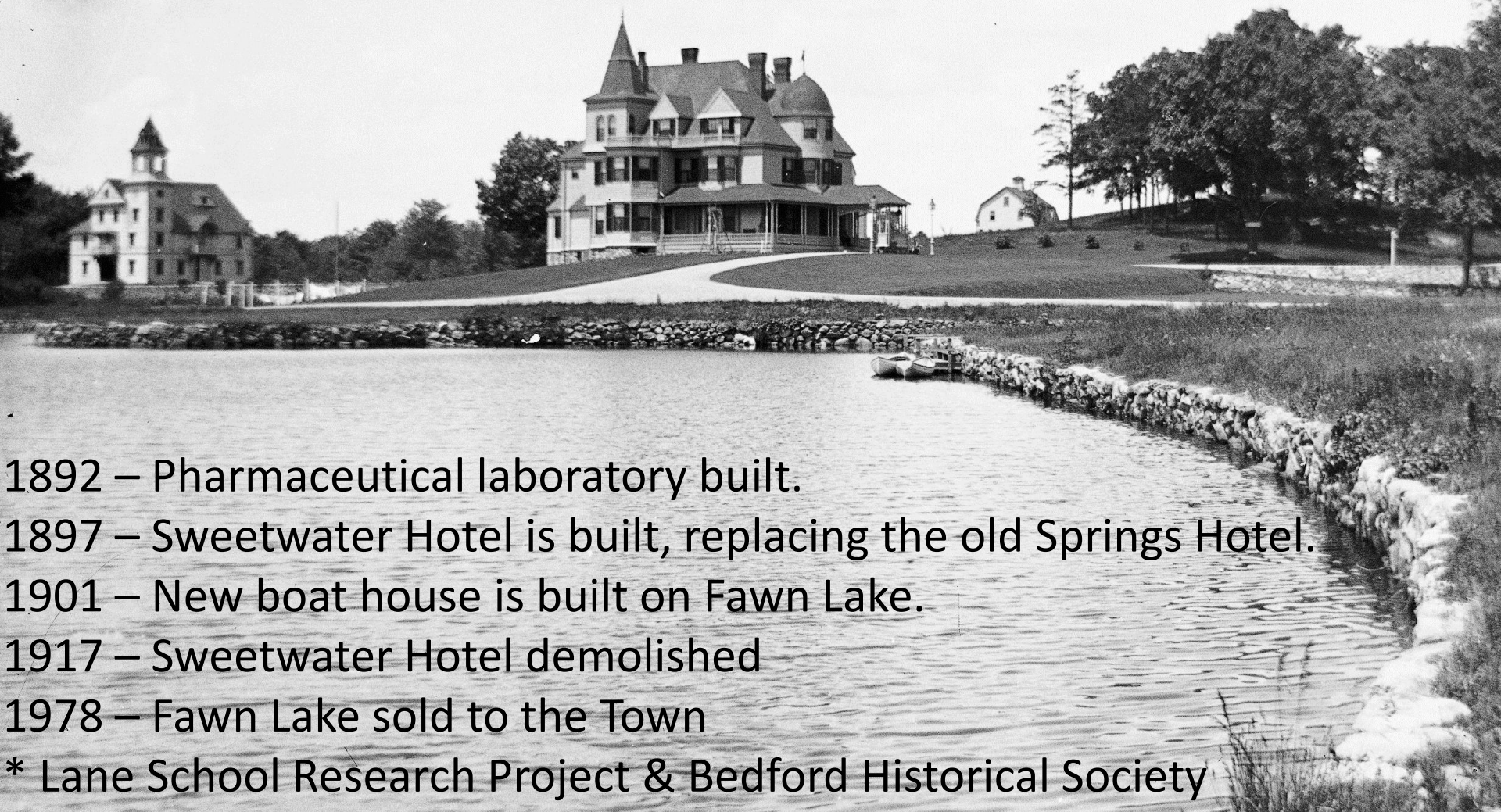
BRIEF HISTORY OF BEDFORD SPRINGS*

1843 – Springs Hotel built.

1866 – New York Pharmaceutical purchases the Bedford Springs property.

1877 – The narrow-gauge railroad between Bedford and Billerica opens.

1888 – Post office is established at Bedford Springs.



1892 – Pharmaceutical laboratory built.

1897 – Sweetwater Hotel is built, replacing the old Springs Hotel.

1901 – New boat house is built on Fawn Lake.

1917 – Sweetwater Hotel demolished

1978 – Fawn Lake sold to the Town

* Lane School Research Project & Bedford Historical Society



WHAT HAPPENS IF LAKE CONVERTS TO A SWAMP

- *NO OPEN WATER*
- *NUISSANCE ODORS*
- *INCREASE MOSQUITO POPULATION*
- *LOSE RECREATIONAL ACCESS*
- *LOSE ECOLOGIC DIVERSITY*
- *LOSE HISTORIC FEATURE*
- *DAM REMOVED*



FAWN LAKE COMMITTEE RECOMMENDATION

- *RESTORE FAWN LAKE*
- *RESTORE LAKE DEPTH IN THE NORTHERN AREA*
- *IMPROVE RECREATIONAL ACCESS*
- *ENHANCE ECOLOGIC DIVERSITY*
- *HISTORICAL AUTHENTICITY*
- *LONG TERM RESTORATION*



EVALUATION CRITERIA

- *LONGEVITY OF TREATMENT*
- *ENVIRONMENTAL IMPACT*
- *RECREATIONAL USE*
- *OVERALL PROJECT COST, O&M*
- *LOGISTICS*
- *Pair-wise ranking of these criteria*

PAIR WISE RANKING

RANK SCORE

[illegible]

RESTORATION EVALUATION

1. The committee agreed upon values of analysis:
 - Longevity of Treatment
 - Environmental Impacts
 - Effectiveness removing/reducing unwanted vegetation
 - Recreational Use and Enjoyment
 - Future Operations and Maintenance Requirements
 - Overall Project Cost
 - Neighborhood Impacts
 - Logistics (dewatering, staging, sediment disposal)
 - Time to Permit.
2. The values were prioritized by performing a Pair-Wise Analysis, where each value was compared to another, to arrive at a numerical priority ranking

RESTORATION EVALUATION

3. The values were evaluated against each improvement method as identified by Comprehensive Environmental Inc., and summarized in their “Pond Management Strategies Matrix” prepared in March 2015.
4. Each method was ranked based on how it scored on our prioritized values.
5. Hydraulic Dredging was the top method as it scored the highest in relation to our prioritized values.

RESTORATION OPTIONS

HYDRO-RAKING



MECHANICAL WET DREDGING



HYDRAULIC DREDGING



MECHANICAL DRY DREDGING



RESTORATION OPTIONS



- *MECHANICAL DRY DREDGING*
- *MECHANICAL WET DREDGING*
- *HYDRO-RAKING*
- *HYDRAULIC DREDGING*
- *HERBICIDES*
- *WATER LEVEL DRAWDOWN*
- *VEGETATION BARRIERS*
- *AERATION/CIRCULATION*

RESTORATION BASIS OF DESIGN

- *RESTORE 60% OF THE LAKE ORIGINAL DEPTH*
- *MAINTAIN 40% OF LAKE AS IS FOR ECOLOGICAL DIVERISTY*
- *IMPLEMENT WITHOUT DRAINING THE LAKE*
- *INCORPORATE DAM REPLACEMENT INTO PERMITTING*
- *IMPLEMENT STORMWATER TREATMENT*
- *MAINTAIN ECOLOGICAL DIVERSITY*
- *PRESERVE HISTORIC CHARACTER*
- *CONTROL WATER QUALITY*
- *MAINTAIN FISHING ACCESS*
- *PREVENT FISH KILLS – DEPLETED OXYGEN*
- *IMPROVE BOAT AND SKATING ACCESS*

RESTORATION PLAN DESIGN



RECOMMENDED PLAN

- *UTILIZE HYDRAULIC DREDGING, SOFT SEDIMENT ONLY*
- *DREDGE 60% OF THE LAKE, THE NORTHERLY PORTION*
- *PRESERVE 40% AS SHALLOW HABITAT*
- *TREAT STORMWATER*
- *REDUCE NUTRIENT LEVELS IN LAKE*
- *REPLACE DAM, INCORPORATE INTO PERMITTING*
- *EVALUATE ADDITIONAL MEASURES, SUCH AS CIRCULATION, TO ENHANCE DESIGN*

WHY HYDRAULIC DREDGING?

- *RANKED HIGHEST BECAUSE OF LONGEVITY & COST*
- *LESS ENVIRONMENTAL IMPACT*
- *IMPLEMENT WITHOUT DRAINING THE LAKE*
- *ALLOWS FOR INCREMENTAL IMPLEMENTATION*
- *60/40 SPLIT IS A COMPROMISE OF COST AND BENEFITS*
- *HELPS CONTROL WATER QUALITY*
- *MAINTAINS FISHING ACCESS*
- *PREVENTS DEPLETED OXYGEN CONDITIONS*
- *SUPPORTS HISTORICAL RECREATION*



QUESTIONS & DISCUSSION